Digital Signal Processing

PART - A

UNIT - 1
Discrete Fourier Transforms (DFT): Frequency domain sampling and reconstruction of discrete time signals. DFT as a linear transformation, its relationship with other transforms.

7 Hours

UNIT - 2
Properties of DFT, multiplication of two DFTs- the circular convolution, additional DFT properties, use of DFT in linear filtering, overlap-save and overlap-add method.

6 Hours

UNIT - 3
Fast-Fourier-Transform (FFT) algorithms: Direct computation of DFT, need for efficient computation of the DFT (FFT algorithms).

8 Hours

UNIT - 4
Radix-2 FFT algorithm for the computation of DFT and IDFT—decimation-in-time and decimation-in-frequency algorithms. Goertzel algorithm, and chirp-z transform

6 Hours

PART - B

UNIT - 5
IIR filter design: Characteristics of commonly used analog filters – Butterworth and Chebysheve filters, analog to analog frequency transformations.

6 Hours

UNIT - 6
FIR filter design: Introduction to FIR filters, design of FIR filters using - Rectangular, Hamming, Bartlet and Kaiser windows, FIR filter design using frequency sampling technique

6 Hours
UNIT - 7
Design of IIR filters from analog filters (Butterworth and Chebyshev) - impulse invariance method. Mapping of transfer functions: Approximation of derivative (backward difference and bilinear transformation) method, Matched z transforms, Verification for stability and linearity during mapping

7 Hours

UNIT - 8
Implementation of discrete-time systems: Structures for IIR and FIR systems-direct form I and direct form II systems, cascade, lattice and parallel realization.

6 Hours

TEXT BOOK:

REFERENCE BOOKS: